What is claimed is:

1. A method of detecting a change in a vascular condition, comprising:

receiving sound information associated with blood flowing through a vascular structure;

converting the sound information into data associated with a plurality of cardiac cycles;

processing the data associated with the plurality of cardiac cycles to determine an acoustic characteristic associated with a current state of the vascular condition; and

detecting the change in the vascular condition based on a difference between the acoustic characteristic associated with the current state of the vascular condition and an acoustic characteristic associated with an earlier state of the vascular condition.

2. A method as defined in claim 1, wherein detecting the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular condition and the acoustic characteristic associated with the earlier state of the vascular condition includes detecting a change in an amount of stenosis associated with the vascular structure.

3. A method as defined in claim 1, wherein detecting the change in the vascular condition includes using the difference between the acoustic characteristic associated with the current state of the vascular condition and the acoustic characteristic associated with the earlier state of the vascular condition to calculate a parameter associated with a change in a diameter associated with the vascular structure.

4. A method as defined in claim 3, wherein detecting the change in the vascular condition includes comparing the parameter associated with the change in the diameter to a threshold value associated with a significant change in the vascular structure.

5. A method as defined in claim 1, wherein detecting the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular structure and the acoustic characteristic associated with the earlier state of the vascular condition includes calculating a difference between first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition.

6. A method as defined in claim 5, wherein the first and second spectral data include at least one of average spectral data and dominant frequency data.

7. A method as defined in claim 5, wherein calculating the difference between the first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and the second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition includes calculating at least one of a true root mean square, a root mean square, and a mean of the difference between the first and second spectral data.

8. A method as defined in claim 1, wherein detecting the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular structure and the acoustic characteristic associated with the earlier state of the vascular condition includes calculating a difference between first temporal data associated with the acoustic characteristic associated with the earlier state of the vascular condition and second temporal data associated with the acoustic characteristic associated with the current state of the vascular condition.

9. A method as defined in claim 8, wherein calculating the difference between the first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and the second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition includes calculating at least one of a true root mean square, a root mean square, and a mean of the difference between the first and second temporal data.

10. A method as defined in claim 8, wherein the first and second temporal data include signal envelope data.

11. A method as defined in claim 1, wherein receiving the sound information associated with the blood flowing through the vascular structure includes receiving the sound information via a plurality of acoustic sensors proximate to the vascular structure.

12. A method as defined in claim 1, wherein converting the sound information into the data associated with the plurality of cardiac cycles includes using signal envelope template data to temporally align the data associated with the plurality of cardiac cycles.

13. A method as defined in claim 12, wherein using the signal envelope template data to temporally align the data associated with the plurality of cardiac cycles includes identifying each of the cardiac cycles using at least one of maxima information and cross correlation information.

14. A method as defined in claim 12, wherein using the signal envelope template data to temporally align the data associated with the plurality of cardiac cycles includes calculating a difference between the data associated with each of the cardiac cycles and the template data.

15. A method as defined in claim 1, wherein processing the data associated with the plurality of cardiac cycles to determine the acoustic characteristic associated with the current state of the vascular condition includes selecting a band of frequencies that increases a correlation between the acoustic characteristic and the vascular condition.

16. A method as defined in 15, wherein selecting the band of frequencies that increases the correlation between the acoustic characteristic and the vascular condition includes automatically optimizing the band of frequencies.

17. A system for detecting a change in a vascular condition, comprising:

a memory; and

a processor coupled to the memory and programmed to:

receive sound information associated with blood flowing through a vascular structure;

convert the sound information into data associated with a plurality of cardiac cycles;

process the data associated with the plurality of cardiac cycles to determine an acoustic characteristic associated with a current state of the vascular condition; and

detect the change in the vascular condition based on a difference between the acoustic characteristic associated with the current state of the vascular condition and an acoustic characteristic associated with an earlier state of the vascular condition.

18. A system as defined in claim 17, wherein the processor is programmed to detect the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular condition and the acoustic characteristic associated with the earlier state of the vascular condition by detecting a change in an amount of stenosis associated with the vascular structure.

19. A system as defined in claim 17, wherein the processor is programmed to detect the change in the vascular condition using the difference between the acoustic characteristic associated with the current state of the vascular condition and the acoustic characteristic associated with the earlier state of the vascular condition to calculate a parameter associated with a change in a diameter associated with the vascular structure.

20. A system as defined in claim 19, wherein the processor is programmed to detect the change in the vascular condition by comparing the parameter associated with the change in the diameter to a threshold value associated with a significant change in the vascular structure.

21. A system as defined in claim 17, wherein the processor is programmed to detect the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular structure and the acoustic characteristic associated with the earlier state of the vascular condition by calculating a difference between first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition.

22. A system as defined in claim 21, wherein the first and second spectral data include at least one of average spectral data and dominant frequency data.

23. A system as defined in claim 21, wherein the processor is programmed to calculate the difference between the first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and the second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition by calculating at least one of a true root mean square, a root mean square, and a mean of the difference between the first and second spectral data.

24. A system as defined in claim 17, wherein the processor is programmed to detect the change in the vascular condition based on the difference between the acoustic

characteristic associated with the current state of the vascular structure and the acoustic characteristic associated with the earlier state of the vascular condition by calculating a difference between first temporal data associated with the acoustic characteristic associated with the earlier state of the vascular condition and second temporal data associated with the acoustic characteristic associated with the current state of the vascular condition.

25. A system as defined in claim 24, wherein the processor is programmed to calculate the difference between the first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and the second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition by calculating at least one of a true root mean square, a root mean square, and a mean of the difference between the first and second temporal data.

26. A system as defined in claim 24, wherein the first and second temporal data include signal envelope data.

27. A system as defined in claim 17, wherein the processor is programmed to receive the sound information associated with the blood flowing through the vascular structure via a plurality of acoustic sensors proximate to the vascular structure.

28. A system as defined in claim 17, wherein the processor is programmed to convert the sound information into the data associated with the plurality of cardiac cycles using signal envelope template data to temporally align the data associated with the plurality of cardiac cycles.

29. A system as defined in claim 28, wherein the processor is programmed to use the signal envelope template data to temporally align the data associated with the plurality of cardiac cycles by identifying each of the cardiac cycles using at least one of maxima information and cross correlation information.

30. A system as defined in claim 28, wherein the processor is programmed to use the signal envelope template data to temporally align the data associated with the plurality of cardiac cycles by calculating a difference between the data associated with each of the cardiac cycles and the template data.

31. A system as defined in claim 17, wherein the processor is programmed to process the data associated with the plurality of cardiac cycles to determine the acoustic characteristic associated with the current state of the vascular condition by selecting a band of frequencies that increases a correlation between the acoustic characteristic and the vascular condition.

32. A method as defined in 31, wherein the processor is programmed to select the band of frequencies that increases the correlation between the acoustic characteristic and the vascular condition includes by automatically optimizing the band of frequencies.

33. A machine readable medium having instructions stored thereon that, when executed, cause a machine to:

receive sound information associated with blood flowing through a vascular structure;

convert the sound information into data associated with a plurality of cardiac cycles;

process the data associated with the plurality of cardiac cycles to determine an

acoustic characteristic associated with a current state of a vascular condition; and

detect a change in the vascular condition based on a difference between the acoustic characteristic associated with the current state of the vascular condition and an acoustic characteristic associated with an earlier state of the vascular condition.

34. A machine readable medium as defined in claim 33 having instructions stored thereon that, when executed, cause the machine to detect the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular condition and the acoustic characteristic associated with the earlier state of the vascular condition by detecting a change in an amount of stenosis associated with the vascular structure.

35. A machine readable medium as defined in claim 33 having instructions stored thereon that, when executed, cause the machine to detect the change in the vascular condition using the difference between the acoustic characteristic associated with the current state of the vascular condition and the acoustic characteristic associated with the earlier state of the vascular condition to calculate a parameter associated with a change in a diameter associated with the vascular structure.

36. A machine readable medium as defined in claim 35 having instructions stored thereon that, when executed, cause the machine to detect the change in the vascular condition by comparing the parameter associated with the change in the diameter to a threshold value associated with a significant change in the vascular structure.

37. A machine readable medium as defined in claim 33 having instructions stored thereon that, when executed, cause the machine to detect the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular structure and the acoustic characteristic associated with the earlier state of the vascular condition by calculating a difference between first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition.

38. A machine readable medium as defined in claim 37, wherein the first and second spectral data include at least one of average spectral data and dominant frequency data.

39. A machine readable medium as defined in claim 37 having instructions stored thereon that, when executed, cause the machine to calculate the difference between the first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and the second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition by calculating at least one of a true root mean square, a root mean square, and a mean of the difference between the first and second spectral data.

40. A machine readable medium as defined in claim 33 having instructions stored thereon that, when executed, cause the machine to detect the change in the vascular condition based on the difference between the acoustic characteristic associated with the current state of the vascular structure and the acoustic characteristic associated with the earlier state of the vascular condition by calculating a difference between first temporal data associated with the acoustic characteristic associated with the earlier state of the vascular condition and second temporal data associated with the acoustic characteristic associated with the current state of the vascular condition.

41. A machine readable medium as defined in claim 40 having instructions stored thereon that, when executed, cause the machine to calculate the difference between the first spectral data associated with the acoustic characteristic associated with the earlier state of the vascular condition and the second spectral data associated with the acoustic characteristic associated with the current state of the vascular condition by calculating at least one of a true root mean square, a root mean square, and a mean of the difference between the first and second temporal data.

42. A machine readable medium as defined in claim 40, wherein the first and second temporal data include signal envelope data.

43. A machine readable medium as defined in claim 33 having instructions stored thereon that, when executed, cause the machine to receive the sound information associated with the blood flowing through the vascular structure includes receiving the sound information via a plurality of acoustic sensors proximate to the vascular structure.

44. A machine readable medium as defined in claim 33 having instructions stored thereon that, when executed, cause the machine to convert the sound information into the data associated with the plurality of cardiac cycles using signal envelope template data to temporally align the data associated with the plurality of cardiac cycles.

45. A machine readable medium as defined in claim 44 having instructions stored thereon that, when executed, cause the machine to use the signal envelope template data to temporally align the data associated with the plurality of cardiac cycles by identifying each of the cardiac cycles using at least one of maxima information and cross correlation information.

46. A machine readable medium as defined in claim 44 having instructions stored thereon that, when executed, cause the machine to use the signal envelope template data to temporally align the data associated with the plurality of cardiac cycles by calculating a difference between the data associated with each of the cardiac cycles and the template data.

47. A machine readable medium as defined in claim 33, wherein the instructions, when executed, cause the machine to process the data associated with the plurality of cardiac cycles to determine the acoustic characteristic associated with the current state of the vascular condition by selecting a band of frequencies that increases a correlation between the acoustic characteristic and the vascular condition.

48. A machine readable medium as defined in 47, wherein the instructions, when executed, cause the machine to select the band of frequencies that increase the correlation between the acoustic characteristic and the vascular condition by automatically optimizing the band of frequencies.

49. A method of detecting a vascular condition, comprising:

receiving sound information associated with blood flowing through a vascular structure;

converting the sound information into data associated with a plurality of cardiac cycles;

processing the data associated with the plurality of cardiac cycles to determine first and second acoustic characteristics associated with the vascular condition; and

detecting the vascular condition based on a comparison of the first and second acoustic characteristics.

50. A method as defined in claim 49, wherein the first and second acoustic characteristics are associated with respective first and second surface locations associated with a patient.

51. A method as defined in claim 49, wherein the first and second acoustic characteristics are associated with respective first and second frequency bands.

52. A method as defined in claim 49, wherein the first and second acoustic characteristics are associated with respective first and second portions at least one of one of a cardiac cycle and a respiratory cycle.

53. A method as defined in claim 49, wherein the first and second acoustic characteristics include at least one of an amplitude characteristic, a cross-correlation characteristic, a time delay characteristic, an attack characteristic, and a decay characteristic.

54. A method as defined in claim 49, wherein processing the data associated with the plurality of cardiac cycles includes temporally aligning the data associated with the plurality of cardiac cycles.

55. A method as defined in claim 54, wherein temporally aligning the data associated with the plurality of cardiac cycles includes temporally aligning the data associated with the plurality of cardiac cycles based on EKG information.

56. A method as defined in claim 49, further comprising varying one of the converting and processing operations based on earlier collected data.

57. A method as defined in claim 49, further comprising automatically realigning a plurality of sensors with the vascular condition.

58. A method as defined in claim 49, wherein processing the data associated with the plurality of cardiac cycles includes correcting the data associated with the plurality of cardiac cycles based on transfer function information.

59. A method as defined in claim 49, wherein processing the data associated with the plurality of cardiac cycles includes calculating a difference based on low flow rate spectral information.

60. A system for detecting a vascular condition, comprising:

a memory;

a processor coupled to the memory and programmed to:

receive sound information associated with blood flowing through a vascular structure;

convert the sound information into data associated with a plurality of cardiac cycles;

process the data associated with the plurality of cardiac cycles to determine first and second acoustic characteristics associated with the vascular condition; and

detect the vascular condition based on a comparison of the first and second acoustic characteristics.

61. A system as defined in claim 60, wherein the first and second acoustic characteristics are associated with respective first and second surface locations associated with a patient.

62. A system as defined in claim 60, wherein the first and second acoustic characteristics are associated with respective first and second frequency bands.

63. A system as defined in claim 60, wherein the first and second acoustic characteristics are associated with respective first and second portions at least one of one of a cardiac cycle and a respiratory cycle.

64. A system as defined in claim 60, wherein the first and second acoustic characteristics include at least one of an amplitude characteristic, a cross-correlation characteristic, a time delay characteristic, an attack characteristic, and a decay characteristic.

65. A system as defined in claim 60, wherein the processor is programmed to process the data associated with the plurality of cardiac cycles by temporally aligning the data associated with the plurality of cardiac cycles.

66. A system as defined in claim 65, wherein the processor is programmed to temporally align the data associated with the plurality of cardiac cycles based on EKG information.

67. A system as defined in claim 60, wherein the processor is programmed to vary one of the converting and processing operations based on earlier collected data.

68. A system as defined in claim 67, wherein the processor is programmed to automatically realign a plurality of sensors with the vascular condition.

69. A system as defined in claim 60, wherein the processor is programmed to process the data associated with the plurality of cardiac cycles by correcting the data associated with the plurality of cardiac cycles based on transfer function information.

70. A system as defined in claim 60, wherein the processor is programmed to process the data associated with the plurality of cardiac cycles by calculating a difference based on low flow rate spectral information.

71. A machine readable medium having instructions stored thereon that, when executed, cause a machine to:

receive sound information associated with blood flowing through a vascular structure;

convert the sound information into data associated with a plurality of cardiac cycles;

process the data associated with the plurality of cardiac cycles to determine first and second acoustic characteristics associated with a vascular condition; and

detect the vascular condition based on a comparison of the first and second acoustic characteristics.

72. A machine readable medium as defined in claim 71, wherein the first and second acoustic characteristics are associated with respective first and second surface locations associated with a patient.

73. A machine readable medium as defined in claim 71, wherein the first and second acoustic characteristics are associated with respective first and second frequency bands.

74. A machine readable medium as defined in claim 71, wherein the first and second acoustic characteristics are associated with respective first and second portions at least one of one of a cardiac cycle and a respiratory cycle.

75. A machine readable medium as defined in claim 71, wherein the first and second acoustic characteristics include at least one of an amplitude characteristic, a cross-correlation characteristic, a time delay characteristic, an attack characteristic, and a decay characteristic.

76. A machine readable medium as defined in claim 71, wherein the instructions, when executed, cause the machine to process the data associated with the plurality of cardiac cycles by temporally aligning the data associated with the plurality of cardiac cycles.

77. A machine readable medium as defined in claim 76, wherein the instructions, when executed, cause the machine to temporally align the data associated with the plurality of cardiac cycles by temporally aligning the data associated with the plurality of cardiac cycles based on EKG information.

78. A machine readable medium as defined in claim 71, wherein the instructions, when executed, cause the machine to vary one of the converting and processing operations based on earlier collected data.

79. A machine readable medium as defined in claim 71, wherein the instructions, when executed, cause the machine to automatically realign a plurality of sensors with the vascular condition.

80. A machine readable medium as defined in claim 71, wherein the instructions, when executed, cause the machine to process the data associated with the plurality of cardiac cycles by correcting the data associated with the plurality of cardiac cycles based on transfer function information.

81. A machine readable medium as defined in claim 71, wherein the instructions, when executed, cause the machine to process the data associated with the plurality of cardiac cycles by determining a difference based on low flow rate spectral information.